SPOT SERIES

SPOT 1500

PROFESSIONAL LOUDSPEAKER SYSTEM

user's manual

ENGLISH

Montarbo

Made in Italy

The lighting flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to humans.

The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions.

IMPORTANT ! SAFETY INSTRUCTIONS

WARNING
In order to protect your own and others' safety and to avoid invalidation of thewarranty of this product, please read this section carefully before operating this product.

- This product has been designed and manufactured for being operated as a speaker system in the applications typical of a sound reinforcement system.
Operation for purposes and in applications other than these has not been covered by the manufacturer in the design of the product, and is therefore to be undertaken at end user's and/or installer's sole risk and responsibility.
- This unit conforms to Class I insulation, and for safe use it is required that the protective earth contact is connected to a grounded (earthed) outlet.

TO AVOID THE RISK OF FIRE AND/OR ELECTRIC SHOCK:

• Never expose these products to rain or moisture, never use it in proximity of water or on a wet surface. Avoid dripping water or water sprays, moreover never place objects full of liquid, such as vases, on top of it. Never let any liquid, as well as any object, enter the products. In case, immediately disconnect it from the mains supply and refer to servicing before operating it again. Never place burning candles or other sources of open flame on top of the device. Keep clean and free from dust the ventilation grids on rear panel.

• Before connecting this product to the mains supply, always make sure that the voltage on the mains outlet corresponds to that stated on the product.

• This product must be connected only to a grounded mains outlet complying to the safety regulations in force via a power cable of adequate copper section terminated with a plug or a connector complying with all safety regulation applicable.
In case the power cable needs to be substituted, use exclusively a cable of the same type and characteristics.
Refer to page 12 for detailed instructions about mains connector's wiring.

• This device is connected to the power line even when the mains switch is off.
As long as it is plugged in there are dangerous electrical potentials inside the device, so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.

• Never place any object on the power cable. Never lay the power cable on a walkway where one could trip over it. Never press or pinch it.

• Never install the product without providing adequate airflow to cool it.
Never obstruct the air intake openings on it. In fixed installations, leave enough room to get to the mains power socket and the mains connector on the back panel.

• Always make sure the Power switch is in its '0' (= off) position before doing any operation on the connections of the product.

• Before attempting to move the product after it has been installed, remove all the connections.

• To disconnect the power cable of this product from the mains supply never pull the cable directly. Hold the body of the plug firmly and pull it gently from the mains supply outlet.

CAUTION!
This products does not contain user serviceable parts.
To prevent fire and/or electrical shock, never disassemble it or remove the rear panel.
For maintenance and servicing always refer to the official Montarbo Distributor in your Country or to qualified personnel specifically authorized by the Distributor.

- When setting-up the system for operation, make sure that the shape and load rating of the surface or the structures that will support it can safely match the product size and weight.

- To avoid shocks, kicks, or whatever action, always reserve a protected area with no access to unqualified personnel as installation site of the product.

- In case the product is used near children and animals closest supervision is necessary.

- This product can generate very high acoustic pressures which are dangerous for the hearing system. Always avoid operation at loud levels if anyone is excessively near to the product.

☛ ***Never expose children to high sound pressures.***

Thank you for the preference you have shown by purchasing the Montarbo® SPOT1500 system.
This manual contains important information about installing and operating the product correctly and safely.
Read this manual carefully in order to thoroughly familiarize yourself with these procedures.

TABLE OF CONTENTS

1 - INTRODUCTION AND APPLICATIONS 4
1.1 - Introduction to SPOT1500 4
1.2 - SPOT1500 - Applications 4

2 - SPOT1500 - SYSTEM'S DESCRIPTION ..... 5 - 8

3 - INSTALLATION AND WIRING ..... 9 - 15
3.1 - Installation 9
3.2 - Ac Mains supply cable 11
3.2.1 - Wiring of POWERCON® connector 12
3.3 - System wiring 13
3.3.1 - Wiring of signal cables 13
3.4 - Parallel connection of multiple systems 15

4 - OPERATION ..... 16 - 18
4.1 - Powering on 16
4.2 - Loading a Preset from control panel 16
4.3 - Connection to a Personal Computer 18

5 - RAConLS SOFTWARE ..... 19 - 33
5.1 - Hardware requirements 19
5.2 - Installation 19
5.3 - Using the program 27
5.3.1 - Building the speaker's list 29
5.3.2 - Main controller window 30
5.3.3 - Management of presets 33

6 - PRODUCT'S CARE AND MAINTENANCE 34

7 - SPOT1500 - BLOCK DIAGRAM 35

8 - TECHNICAL DATA 36

PACKAGE CONTENTS

- model SPOT1500 active biamplified system
- ac power supply cable fitted with PowerCon® connector
- user's manual
- warranty certificate
- CE declaration of conformity

1 - INTRODUCTION AND APPLICATIONS

1.1 - INTRODUCTION TO SPOT1500

SPOT1500 active speaker system features a revolutionary new concept in acoustic and electronic design characterized by painstaking attention in terms of component selection, materials and production techniques.
The result is a product of absolutely contemporary, essential and rigorous design, with great attention to detail.
All the system's drivers, designed with great attention to every detail and custom-built specifically for this system, are equipped with the most efficient and powerful motor assemblies available on the market today:
- woofer with neodymium magnet and long excursion, large diameter voice coil
- controlled directivity wave-guide horn coupled to a neodymium driver with very high magnetic flux.

The portability has been optimized: this system may be carried and installed by a single person.
Very high levels of performance, despite its remarkably small size and low weight, thanks to power amplifiers with digital technology controlled by a dedicated Montarbo DSP processor.

The processor (56 bit, 180 MHz, 24 bit converters) takes care of the filtering, equalization, delay, limiter and diagnostic functions, while optimizing the system's power and linearity. It utilizes an advanced algorithm for the real-time control of both the power output and temperature (both internal and external) of the amplifier, thus increasing the system's overall reliability.
5 presets are available, one of which may be customized by the user, thus adapting the speaker's acoustic response to the user's personal taste.
A dedicated software program that was developed in our R&D laboratory makes it possible to operate the speaker on a remote control basis by means of a Personal Computer and our LD2.4 USB interface.
With a single LD2.4 USB interface it is possible to operate up to 10 speaker systems by remote control.
The remote control allows: programming and storage of custom presets in the PC; a 10 filter "fully parametric" equalizer; adjustment of the delay and output level of each speaker system; monitoring of the power amplifier's condition (temperature, protection circuits, limiters and thermal alarms).
The control software makes these systems extremely flexible.
In fixed installations the ability to adjust the delay and equalizer make it possible to align the sound system's phase and frequency response

1.2 - SPOT1500 - APPLICATIONS

It is perfect for live music, but its excellent vocal/speech intelligibility at long distance qualify it as a highly recommended option for conventions.
This system was designed to simplify the task of assembling clusters by simply placing multiple enclosures side-by-side when wider horizontal dispersion is required. A 3 element system results in a 150° horizontal coverage, maintaining tonal coherence and interference-free horizontal wave-front summing.

2 - SPOT1500 SYSTEM'S DESCRIPTION

SPOT1500 is a two-way active bi-amplified speaker system equipped with **two class-D amplifiers** (with switching power supplies) that are able to provide a total of 1500 Watts EIAJ, managed by the Montarbo DSP.

a - One 15" woofer, featuring a 4" voce coil and a powerful, shielded, neodymium magnet. The magnet is front-mounted, allowing for improved cooling under power-intensive conditions.

b - One HF driver with a 1.4" throat and 3" voice coil, featuring a neodymium magnet and titanium diaphragm, loaded by an high directivity (50° H x 40° V) wave-guide horn. The horn has a very low cut-off frequency, resulting in improved far-field intelligibility.

c - Cabinet made from birch plywood, with high-impact, chip-resistant paint.

d - Steel protection grill with foam protection.

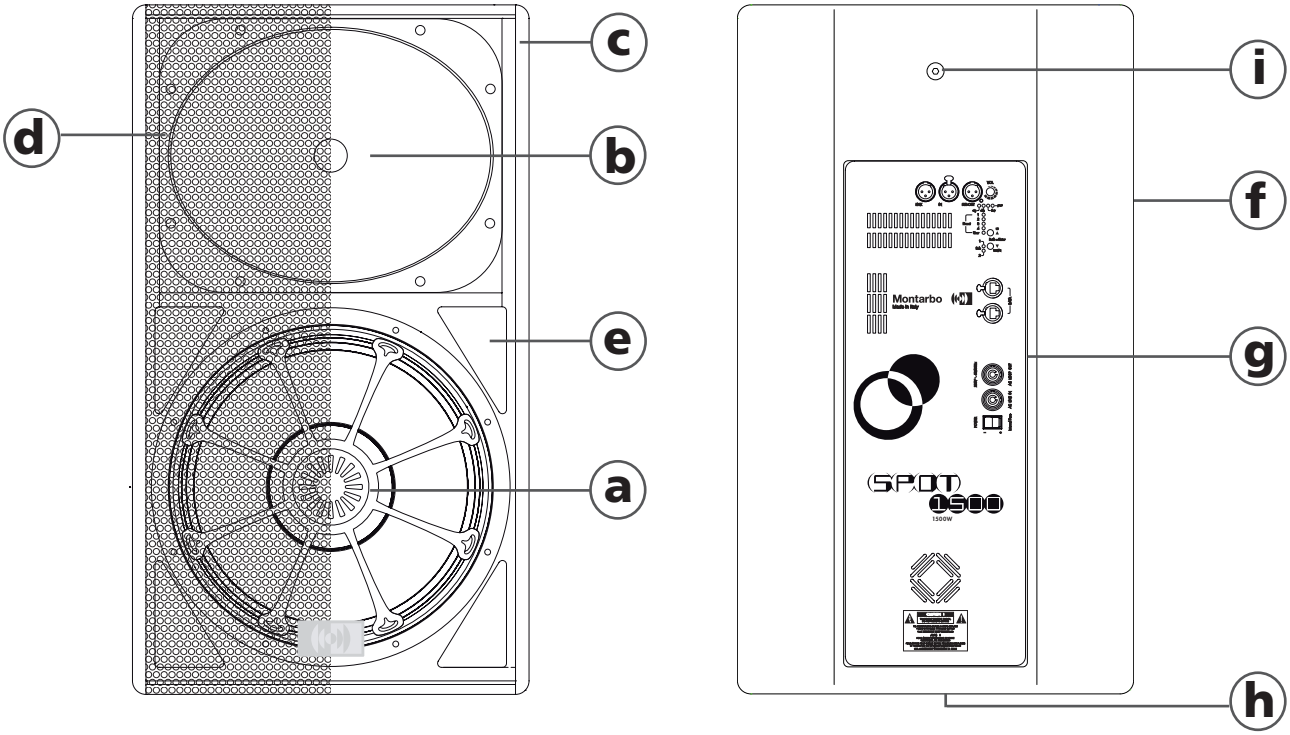
e - Bass reflex vents.

f - Carrying handles.

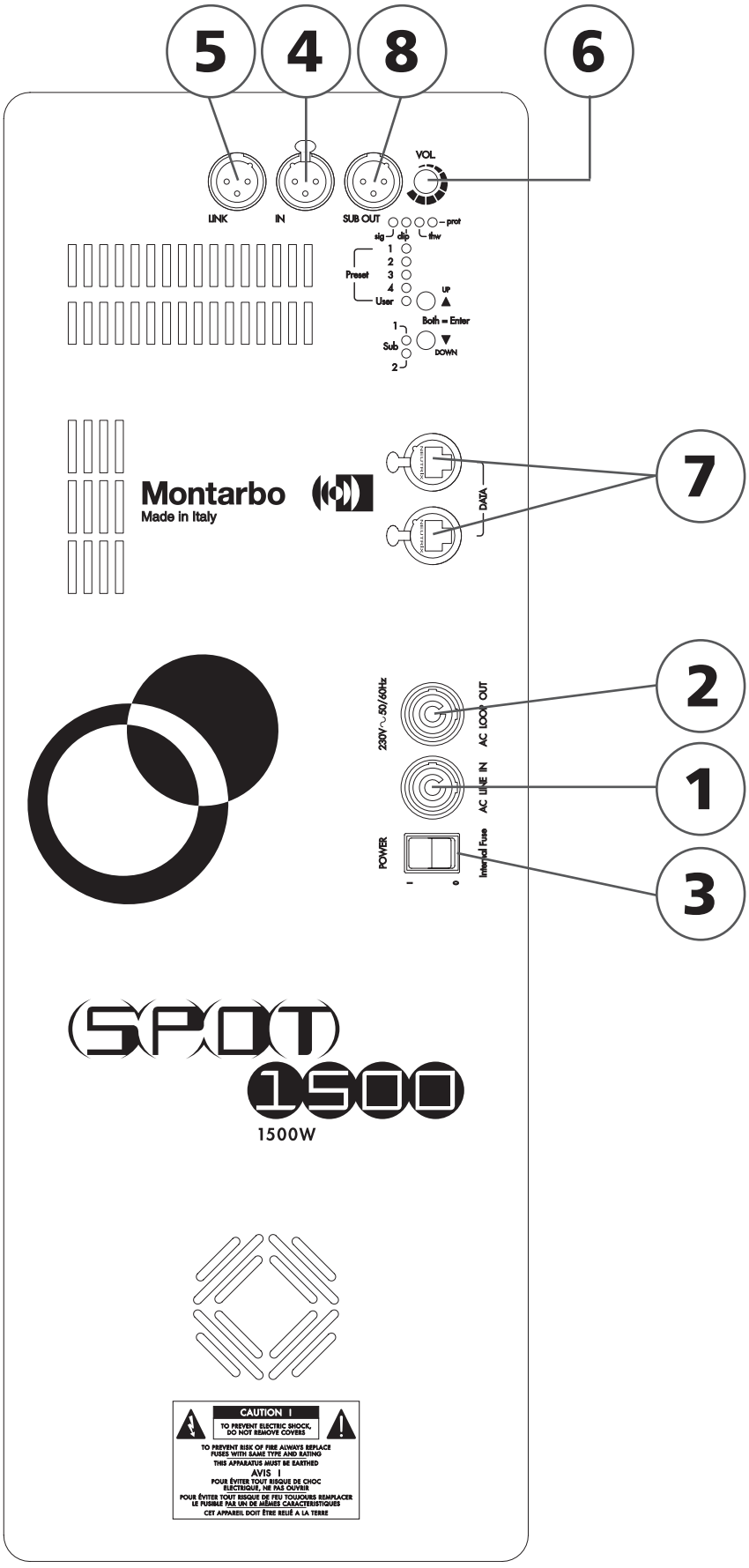
g - Controls and connections panel.

h - Speaker-stand adapter.

i - M10 threaded inserts.



SPOT1500 - CONTROLS AND CONNECTIONS PANEL



CONTROLS AND CONNECTIONS PANEL

1 - AC LINE IN: ac line input connector.
This is the mains supply inlet socket with type A PowerCon® (blue) connector which guarantees a reliable, vibration-proof contact.
Connect it to the mains socket using only a mains cable with suitable conductors capable of handling the current involved, equipped with a ground conductor, marked with the applicable, country specific, safety approvals and fitted with a power plug certified for the actual current value. Refer to par. 3.2 for connector wiring instructions.
When installing the speaker system, make sure that it is easy to get to this socket and to the mains plug.

2 - AC LOOP OUT: power link connector.
This type B (gray) PowerCon® connector allows you to link other devices to the mains power (max current available: 13,6A).
Refer to par. 3.2 for connector wiring instructions.
Maximum current available from this connector is limited. Refer to par. 3.2.

3 - Mains ON/OFF switch.
Even when the switch is in the 0 (off) position, the AC LOOP OUT connector (2) is connected to the mains power. Devices connected to it must be switched off by means of their power switches.

4 - Input connector.
It is a balanced, line level input, that may be fed by balanced or unbalanced sources. Connect it to the mixer output. It is a 3-pin female XLR connector, balanced. For wiring details, refer to par. 3.3.1.

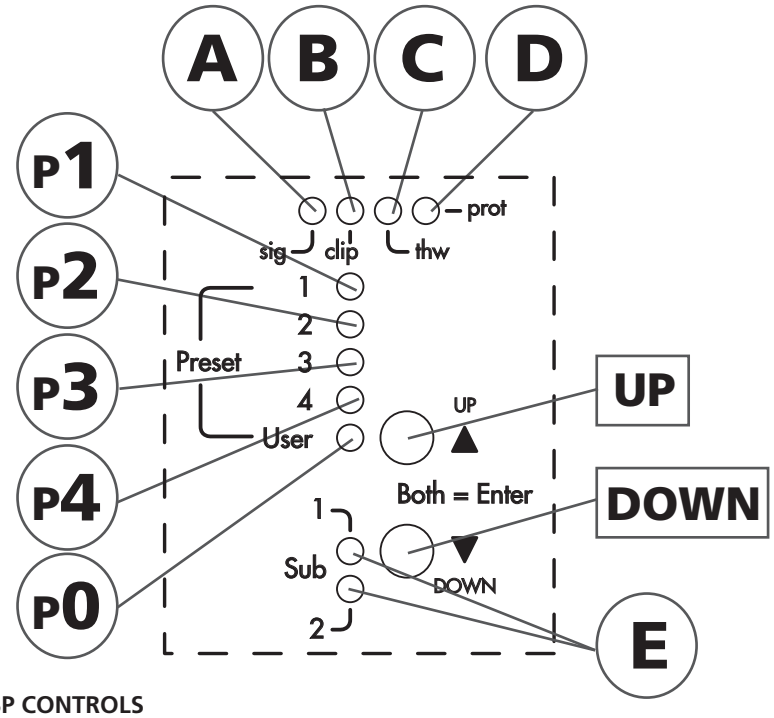
5 - Input link connector. It is wired in parallel to the input connector (4) and it makes possible to send the input signal to other equipment (usually to other self-powered speaker systems). For wiring details refer to par. 3.3.1.
For details about parallel connection of multiple systems, refer to par. 3.4.

6 - Master volume control that adjusts the system's volume (and the volume of the external subwoofer, if connected).

7 - RJ45 sockets of the two DATA ports: they are intended for connection to the Montarbo USBNet control network: a Montarbo LD2.4 USBNet interface and/or another active speaker of the FULL, SPOT and WIDE series.
Use standard 8 poles ETHERNET cables (CAT5 or higher).
For more detailed information, refer to par. 4.3.

8 - SUB OUT socket for driving an external active sub-woofer.
By selecting the suitable preset (refer to par. 4.2) the internal DSP may be configured to drive a subwoofer with or without an internal crossover filter. In the first case the output is a wide-band signal, in the second case the output is band-limited and suitable for most active sub-woofers.
It is a 3-pin male XLR connector.
Refer to par. 3.3.1 for wiring details.

SPOT1500 - DSP CONTROLS



DSP CONTROLS

A - Green LED '**sig**' (**signal**): it lights up when an input signal is detected.

B - Red LED '**clip**': it lights up when a **clipping** (excess of signal level) is detected in the input stage of the internal DSP. If this indicator flashes frequently or is always on, reduce the input level, acting on the volume control (6) or on the mixer's output gain control.

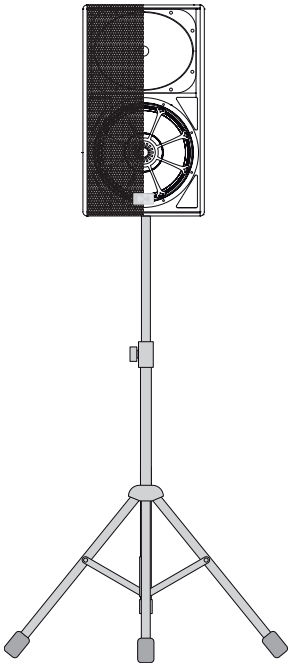
C - Yellow LED '**thw**' (**thermal warning**): when lit, it indicates that the temperature of the internal power amplifiers is close to, or higher than, the attention threshold: the internal microprocessor is analyzing the available energy. It is a normal behavior for this LED to flash even in absence of input signal. For a correct operation, check periodically (monthly) the rear panel's ventilation grills and verify that they are free of obstructions.
Also check that the speaker's temperature is not too high due to proximity to heat sources or because subjected to direct radiation from the sun.

D - Red LED '**prot**' (**protection**): this led indicates the intervention of the protection circuit of the internal power amplifiers.
The reason may be an excess in terms of temperature, of output current or a fluctuation in mains supply value (lighting strikes or brown outs).
The LED comes on even if the speaker has been muted by remote control, via the RAConLS software program (refer to par. 5.3).

P1 - **P2** - **P3** - **P4** - **P0**: these LEDs show the **active Preset**.
P1 - P2 - P3 - P4 are the factory (default) preset, P0 is the user preset.
The four LEDs P1 - P2 - P3 - P4 come on when the speaker has been muted by remote control (refer to par. 5.3).

UP - **DOWN**: these pushbuttons allow for **preset selection**.
For a description of the presets and how to load them refer to par. 4.2.

E - Green '**Sub1**' and '**Sub2**' LEDs: when on, they indicate that the SUB OUT output is active and what type of sub-woofer drive signal has been selected (refer to par. 4.2).



3 - INSTALLATION AND WIRING

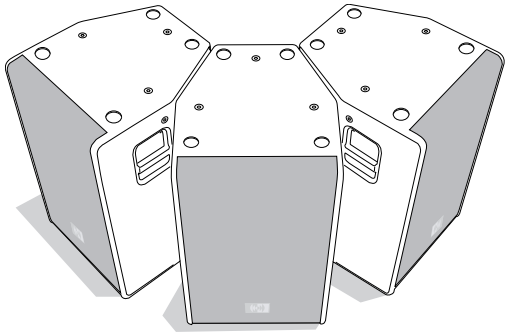
3.1 - INSTALLATION

Make sure that the installation position is a protected one so that the cables cannot be trampled or tripped on.
Make sure that the shape and load rating of the mounting surface are suitable for a safe installation.
If the system is placed over a surface, make sure that the cables are placed in a protected position to avoid the risk of the speakers falling over if somebody trips over them.

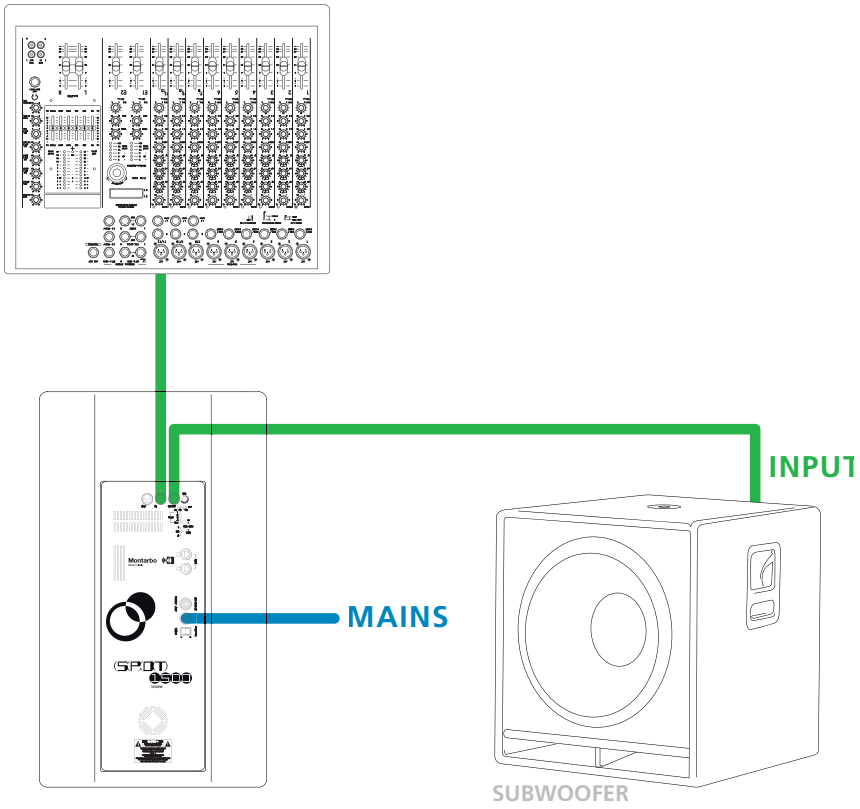
The full-range SPOT1500 speakers may be installed in various ways, and the internal DSP presets allow to optimize their performances in the various configurations.
- They may be placed over standard speaker supports stand by means of built-in adapter (h: page 5).
- They may be placed side-by-side to create a 'cluster' of two or more speakers, thus extending the horizontal dispersion without creating wave-front interferences ('Cluster' configuration, P4 preset).

The M10 thresed inserts (i: page 5) are intended for fixed installation by means of standard or custom-made mounting accessories.
For a safe installation is mandatory that these accessories are specified to safely support the speaker weight .It is the installer's responsibility to verify that the installation's safety has not been compromised.

Wire the system's components as described in the following figure.



CLUSTER: Preset P4



AC mains connection

• Make sure the mains power switch is off ('0').
• Check that mains voltage corresponds to the voltage indicated on the panel.
• Use only the factory supplied mains cable or, if a different plug style is needed, a suitable cable with a ground connection and marked with the safety approvals valid in the country of use.
• Leave enough room to get to the mains power socket and the mains connector on the back panel.
As long as it is plugged in there can be dangerous electrical potentials inside the device, even when the mains switch is in the '0' (off) position and the power indicator is off so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.
For details about mains power cable and ac link cable wiring, refer to par. 3.2.

Connection to mixer

• If the mixer has XLR balanced outputs: use standard balanced XLR connectors.
• If the mixer has XLR unbalanced outputs: in this case, unless using a Montarbo mixer, make sure that the XLR outputs on the mixer are unbalanced to IEC 268 standard 1 = GND, 2 = HOT, 3 = GND.
• If the mixer has JACK balanced outputs (stereo jacks): it is possible to use stereo jack-XLR adapters, wired according to IEC 268,
pin 1 = ground (sleeve), pin 2 = tip, pin 3 = ring.
• If the mixer has JACK unbalanced outputs (mono jacks):
use suitable Jack-XLR male adapters unbalanced according to IEC 268
pin 1 = ground, pin 2 = tip, pin 3 = ground.

Connection to a sub-woofer

• If the sub-woofer has an XLR balanced input (female): use a standard balanced XLR cable (male-female).
• If the subwoofer has an XLR unbalanced input: make sure that the input is unbalanced according to IEC 268 standard 1 = GND, 2 = HOT, 3 = GND.
• If the sub-woofer has a JACK balanced input (stereo jack): it is possible to use a stereo jack-XLR adapter, wired according to IEC 268
pin 1 = ground (sleeve), pin 2 = tip, pin 3 = ring.
• If the sub-woofer has a JACK unbalanced input (mono jack): use suitable Jack-XLR female adapter unbalanced according to IEC 268
pin 1 = ground, pin 2 = tip, pin 3 = ground.

• Always use only heavy gauge, high quality SHIELDED cables (signal cables).

• Always make sure that the mixer and the powered enclosures are switched off before connecting them.
This will avoid annoying noises and signal peaks, which can also be dangerous for the enclosures themselves.

For details about signal cables wiring, refer to par. 3.3.1.

3.2 - AC MAINS SUPPLY CABLE

Use the cable supplied with the system. If another cable is needed, always use a cable with specifications suitable to the value of the current involved, considering the current drain of the system and, just in case, the current drain of the devices powered by the AC LOOP OUT socket.

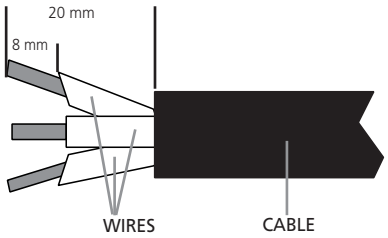
CAUTION
The AC LINE IN socket (**1** page 7) is rated for a 20A maximum current. This means that the maximum current that may be sourced from the AC LOOP OUT socket (**2**) is 13.6A (20A: max current rating of POWERCON® input socket - 1 - minus 6.3A = maximum current drained by SPOT1500 system).

The maximum current drain of the sum of the devices powered by the cable connected to the AC LINE IN socket (that means the current drain of the SPOT1500 system plus the maximum current drain of all the other devices powered by the AC LOOP OUT socket) must be lower than 20A. The AC socket that powers connector (**1**), the mating plug and the cable must be suitable for this current value.
When in doubt, always recruit the assistance of a qualified technician.

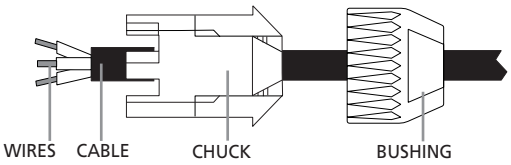
We suggest the use of a 3-conductor cable, with a 3 x 1,0 mm^2 minimum copper section (gauge), suitable for the intended application and environment and complying with all the relevant safety regulations. The cable and the plug must be marked with the applicable, country-specific safety approvals, and the plug must be certified for the actual current value.

Refer to the following paragraph for details about wiring of the POWERCON® connector.

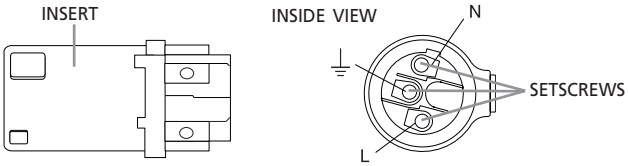
3.2.1 - Wiring of PowerCon® connector



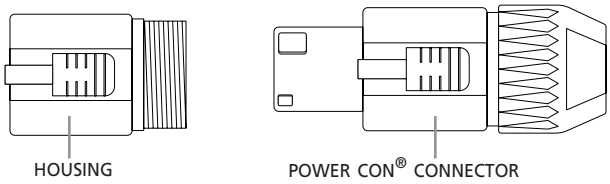
Strip the cable for 20 mm of length and strip each wire for 8 mm of length. We suggest to use a power cable with at least 3 x 1,00 mm² section wires (the insert terminals can however support a cable with wires up to a section of 4 mm²/12AWG).



Insert the power cable into the bushing and into the chuck (white chuck for a cable diameter of 5 ÷ 11 mm; black chuck for a cable diameter of 9.50 ÷ 15 mm).
Insert the wires into the terminals and fasten the clamping device by a flat screw driver.



The wire ends can be clamped in or soldered to the terminal, always paying attention to the symbols shown on the connector:
L (Live - corresponding to the brown wire),
N (Neutral - corresponding to the light blue wire) and
⏚ (Ground - corresponding to the yellow and green wire).



After connecting the wires to the insert, lead the cable through the housing and screw down the bushing.

The connector shown in the preceding example is a POWERCON® model NAC3FCA, blue, similar to the one fitted to the mains power cable supplied with the product.
It fits the blue AC LINE IN (**1**) socket.
It is not compatible with the grey AC LOOP OUT (**2**) socket.
DO NOT FORCE THE WRONG PLUG TO FIT THE WRONG SOCKET !!!!!
In case you must assemble a cable to be connected to the AC LOOP OUT socket, use a grey model NAC3FCB POWERCON® plug.

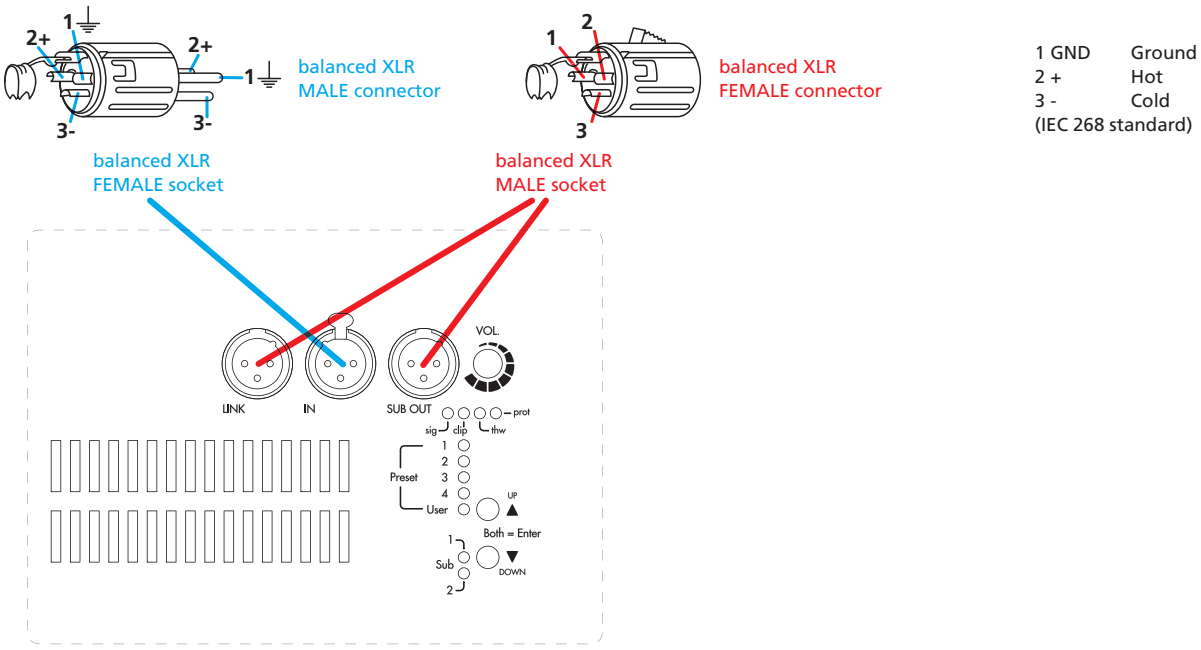
3.3 - SYSTEM WIRING

AC mains connection
- Make sure that the ac line voltage value corresponds to the one indicated on rear panel.
- Connect the mains supply cable to a socket fitted with a proven ground contact.

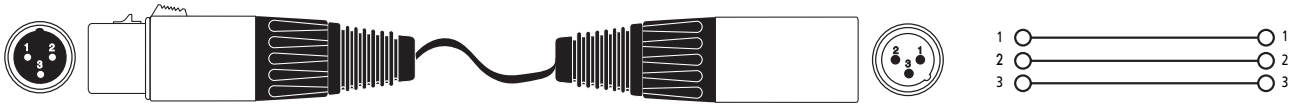
3.3.1 - Wiring of signal cables

The input socket IN (4) and the LINK socket (5) are XLR 3 pole connectors, female (IN) and male (LINK).
They are wired according to IEC 268 (AES1492) standards:
pin 1 = ground, pin 2 = hot (+), pin 3 = cold (-).
Use only screened cables (signal cables) of suitable size and quality.

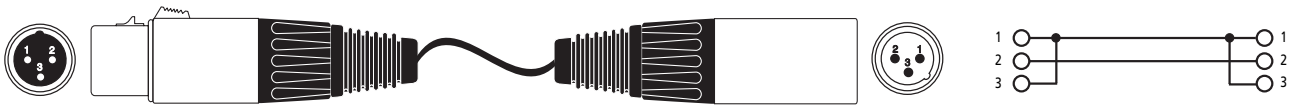
Connector wiring is illustrated in the following images.



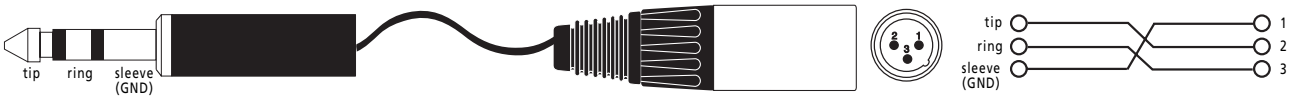
• If the mixer has XLR balanced outputs: use standard balanced XLR connectors.



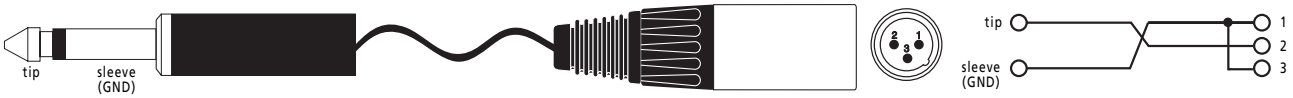
• If the mixer has XLR unbalanced outputs: in this case, unless using a Montarbo mixer, make sure that the XLR outputs on the mixer are unbalanced to IEC 268 standard 1 = GND, 2 = HOT, 3 = GND.



• If the mixer has JACK balanced outputs (stereo jacks):
it is possible to use stereo jack-XLR adapters, wired according to IEC 268
pin 1 = ground (sleeve), pin 2 = tip, pin 3 = ring.



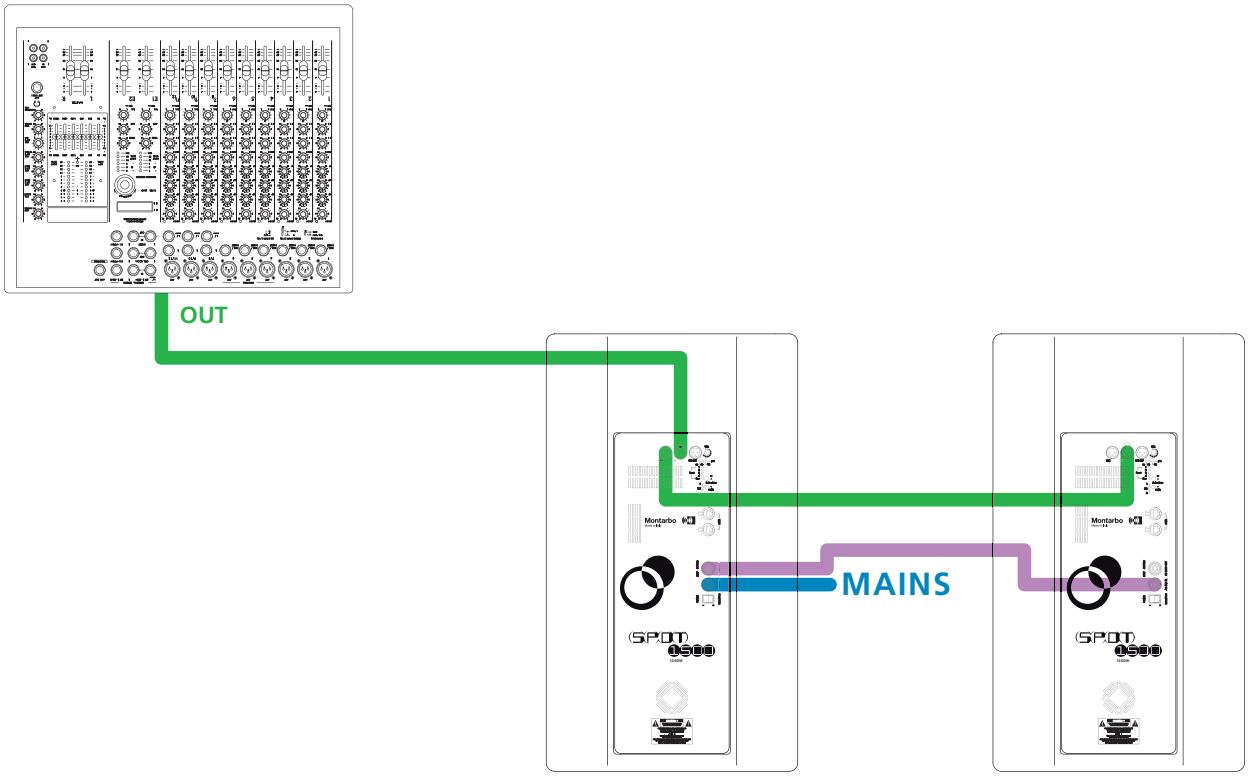
• If the mixer has JACK unbalanced outputs (mono jacks):
use suitable Jack-XLR male adapters unbalanced according to IEC 268
pin 1 = ground, pin 2 = tip, pin 3 = ground.



• **Connection to a sub-woofer:**
- If it has a balanced input: use a balanced XLR cable like the one of the first example.
- If it has an unbalanced input (with a female XLR connector), use a cable like the one in the second example.
- If it as a balanced input (with a stereo jack) use a cable wired like the one in the third example, but with a female XLR connector.
- If it has an unbalanced input (with a mono jack) use a cable wired like the one in the fourth example, but with a female XLR connector.

3.4 - PARALLEL CONNECTION OF MULTIPLE SYSTEMS

Connect the LINK output to the IN input of the other system, as shown in the following image.



If you need to supply ac power to the second system, using the first system's AC LOOP OUT socket, use a suitable cable, at least 3 x 1,0 mm^2, terminated with a POWERCON® NAC3FCB, gray, on one side, and a POWERCON® NAC3FCA, blue, on the other.

The possibility of adjusting the emission delay (refer to par. 5.3.2) make for a successful installation of multiple systems, because it allows for the time alignment of their acoustic emissions.

4 - OPERATION

4.1 - POWERING ON

Before connecting the active speaker systems to a mixer, make sure that all the active speaker's power switches are in the OFF position and that the mixer's master faders are at their minimum position.

To avoid signal peaks, first make the connections, than switch on the mixer first and after the active speakers.
Switch on the system by setting the mains power switch (**3**) to the ON (I) position. At switch on, all the five LEDs (**P1, P2, P3, P4** and **P0**) will light up, then after a few seconds only three of them will stay on; then, after a very short time, only the LED corresponding to the active preset (the preset that was loaded at switching off) will be lit.
During this "boot-up" process the fan will be on: this is normal.

It is now possible to use the system.
If needed, the volume may be adjusted with the potentiometer **6**.
If a different preset must be loaded, follow the procedure described in the following paragraph.

4.2 - LOADING A PRESET FROM CONTROL PANEL

Refer to figure "**DSP controls**" at page 8
The active preset is indicated by the corresponding LED:
P1 - Preset 1 (green) indicates the first factory preset
P2 - Preset 2 (green) indicates the second factory preset
P3 - Preset 3 (green) indicates the third factory preset
P4 - Preset 4 (green) indicates the fourth factory preset
P0 - User preset (yellow): indicates the preset created and stored using the RAConLS software.

If no user preset has been created, the preset P0 is the same as P1.

Sub1 and **Sub2** (green): when on, they indicate that the SUB OUT output is active.

The **Sub1** LED indicates that the output's signal is wide-band (10 to 200 Hz) and suitable to drive a subwoofer that is equipped with an internal cross-over filter (like all Montarbo active sub-woofers)

The **Sub2** LED indicates that the output signal is band-limited (25 to 100 Hz, 18 dB/octave) and suitable to drive active subwoofers that aren't equipped with an internal cross-over (or passive sub-woofers with external power amplifiers). In this case the sub-woofer frequency response is controlled by the SPOT1500 system's internal DSP.

The following table has a description of the factory presets.
In the first 4 presets (number 1 to 4) the SUB OUT output is disabled.

NUMBER	CONFIG. (LED)	DESCRIPTION
1	P1	**FULL RANGE** = for most applications
2	P2	**FLAT** = this allows for the maximum dynamics
3	P3	**WALL** = equalized for a system placed near a wall
4	P4	**CLUSTER** = horizontal cluster of two or more SPOT1500 placed side-by-side
5	P1 + Sub1	**FULL RANGE** + wide range subwoofer output
6	P1 + Sub2	**FULL RANGE** + band-limited subwoofer output
7	P2 + Sub1	**FLAT** + wide range subwoofer output
8	P2 + Sub2	**FLAT** + band-limited subwoofer output
9	P3 + Sub1	**WALL** + wide range subwoofer output
10	P3 + Sub2	**WALL** + band-limited subwoofer output
11	P4 + Sub1	**CLUSTER** + wide range subwoofer output
12	P4 + Sub2	**CLUSTER** + band-limited subwoofer output
0	P0 + ...	**USER PRESET** = one of the above after being personalized by the PC program

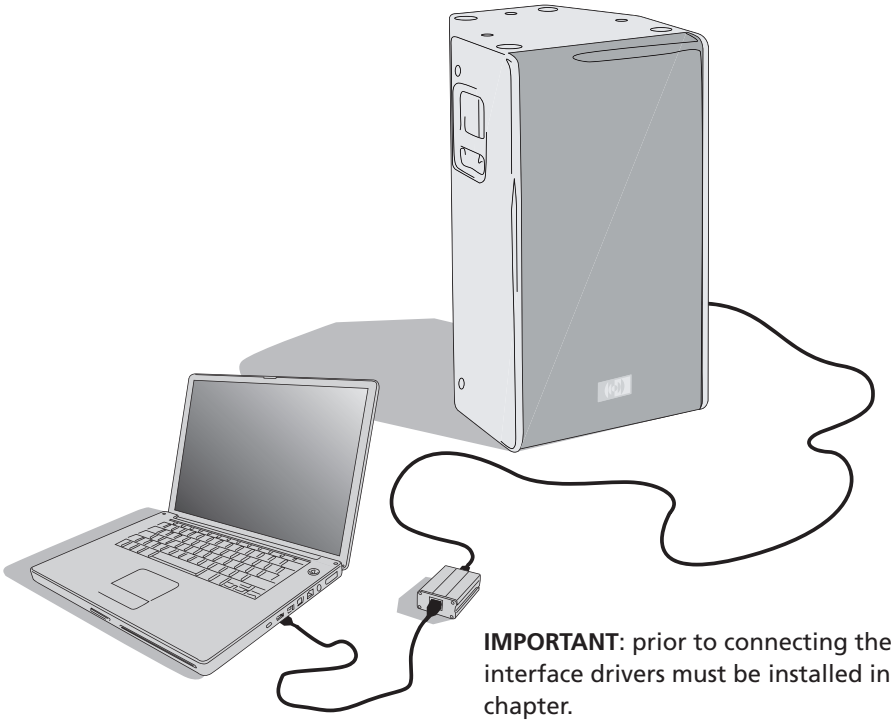
The **UP** and **DOWN** push-buttons make it possible to select the desired preset.
Push the **UP** button and the preset number increases; pushing the **DOWN** button and the preset number decreases.
The selected preset's LED will flash, but the new preset is not yet active.
To make it the active preset, push both the UP and DOWN buttons at the same time. The new preset will be active after a few second delay.
Two LEDs will come on: both P0 and the one related to the preset which has been modified to create P0.
During the presets loading phase, the system is muted.

4.3 - CONNECTION TO A PERSONAL COMPUTER

For this application the optional USB interface model LD2.4 is required. With it the user may control any combination of up to 10 active speaker system of the Montarbo FULL, SPOT and WIDE series.

Connect one of the DATA connectors (7) to the LD 2.4 interface with an ETHERNET CAT5 cable (with RJ45 plugs) and the USB port of the LD2.4 interface to a USB port of the Personal Computer with a USB cable (type A-B).

Connect the other active speaker systems to the first one by means of ETHERNET CAT5 cables, connecting the second DATA socket of the first speaker to a DATA port of the second speaker and so on up to the last one.



IMPORTANT: prior to connecting the LD2.4 interface to the computer, the interface drivers must be installed in the PC, as described in the following chapter.

5 - RAConLS SOFTWARE

5.1 - HARDWARE REQUIREMENTS

- operating system: Windows® 98 SE or higher
- processor: Pentium® III 750 MHz or higher
- video card with **1024 x 768** pixel resolution - 16M colors
- RAM: 64 MB,
- free disk space for installation: 10 MB

5.2 - INSTALLATION

During the installation the USB cable MUST BE UNPLUGGED FROM THE PC.

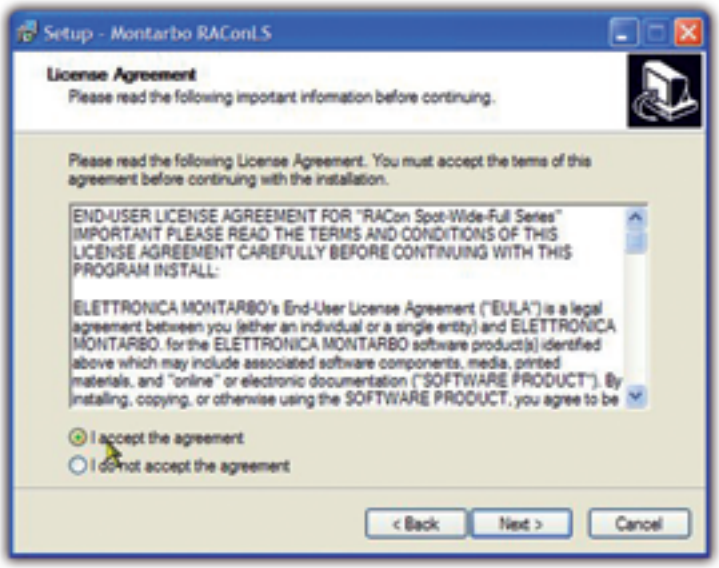
Caution: install the (**RAConLS**) version of the RACon software program specifically intended for use with the FULL, SPOT and WIDE series of active loudspeakers.
Do not use other versions specified for other Montarbo products.
Insert the CD that comes with the LD2.4 interface unit into the computer drive. A self-executing installation program will be launched that will allow you to select the version of the program to be installed.
If the installation process does not start (the "auto run" function may be disabled in your PC), start the process manually by opening 'my computer' and double-clicking on the ***setup_RAConLS.exe*** file contained in the CD.

Click on the
RACon for Spot / Wide / Full series
button

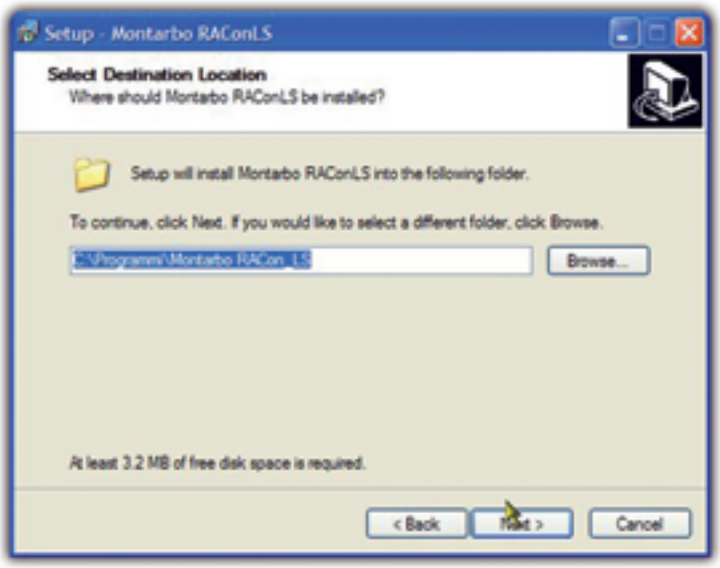
Setup - Montarbo RAConLS
Welcome to the Montarbo RAConLS Setup Wizard
This will install Montarbo RAConLS V1.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

Follow the instructions provided by the *setup wizard* to customize the installation.

Click on the *Next* button.
The following window will open, asking you to accept the license agreement.

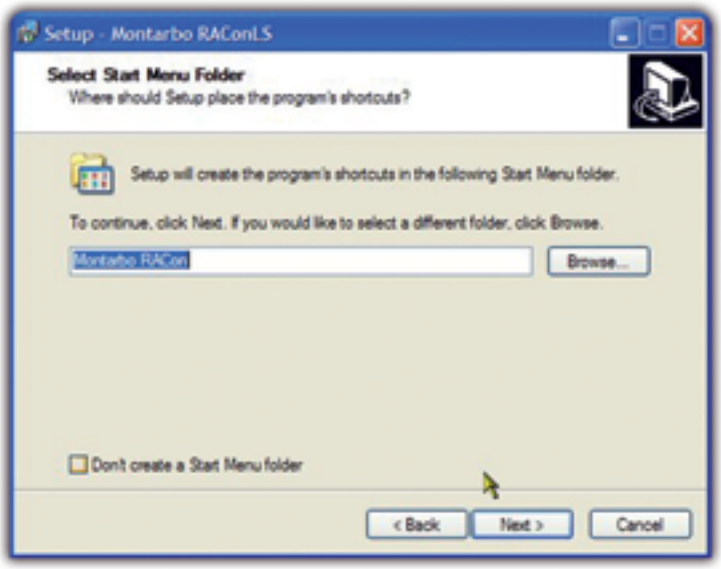

Setup - Montarbo RAConLS
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
END-USER LICENSE AGREEMENT FOR "RACon Spot-Wide-Full Series"
IMPORTANT PLEASE READ THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT CAREFULLY BEFORE CONTINUING WITH THIS PROGRAM INSTALL:
ELETTRONICA MONTARBO's End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and ELETTRONICA MONTARBO, for the ELETTRONICA MONTARBO software product(s) identified above which may include associated software components, media, printed materials, and "online" or electronic documentation ("SOFTWARE PRODUCT"). By installing, copying, or otherwise using the SOFTWARE PRODUCT, you agree to be
I accept the agreement
I do not accept the agreement
< Back
Next >
Cancel

If you want to continue the installation process, click on '*I accept the agreement*', and then click on '*Next*'.

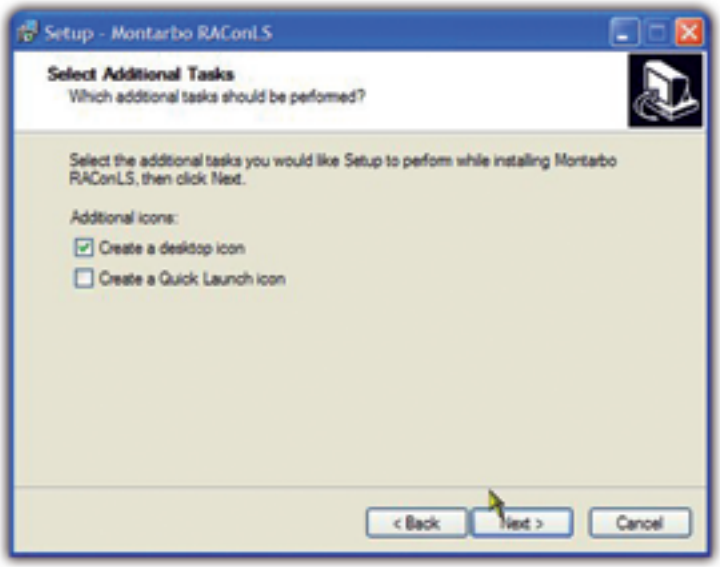

Setup - Montarbo RAConLS
Select Destination Location
Where should Montarbo RAConLS be installed?
Setup will install Montarbo RAConLS into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Programmi\Montarbo RAConLS
Browse...
At least 3.2 MB of free disk space is required.
< Back
Next >
Cancel

This window will open, asking which folder you want the program installed into.

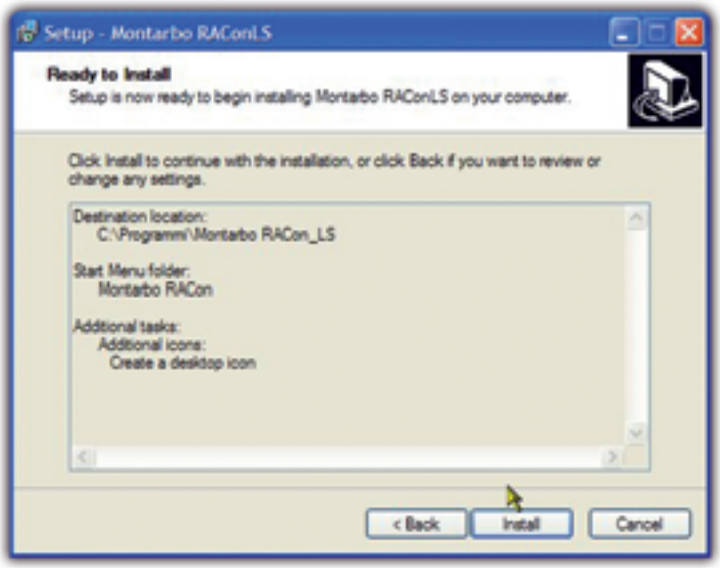
Write the folder name, or browse to search for it, or simply accept the default folder.


Setup - Montarbo RAConLS
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
Montarbo RACon
Browse...
Don't create a Start Menu folder
< Back
Next >
Cancel

The following window allows you to select the program's group name in the Start Menu.


Setup - Montarbo RAConLS
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing Montarbo RAConLS, then click Next.
Additional icons:
Create a desktop icon
Create a Quick Launch icon
< Back
Next >
Cancel

The following window allows you to create icons for the program on the Desktop and/or in the Quick launch bar.


Setup - Montarbo RAConLS
Ready to Install
Setup is now ready to begin installing Montarbo RAConLS on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Programm\Montarbo RACon_LS
Start Menu folder:
Montarbo RACon
Additional tasks:
Additional icons:
Create a desktop icon
< Back
Install
Cancel

Once the various options have been selected, the installation program is ready to copy the program's files to the PC.

Click on *Install* and the **RAConLs** program will be installed in your PC.

After completing installation of the **RaConLS** program, the process will continue with the USB driver for the **USBnet – LD2.4** interface, required for the PC to communicate with the speaker's DSP controllers via the RS485FD serial interface.

During the installation the USB cable MUST BE UNPLUGGED FROM THE PC.

Hardware Installation
The software you are installing for this hardware:
Universal Serial Bus controllers
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

While the USB driver is being installed the operating system will display a warning about failure of compliance regarding the Windows Logo testing program: click on *Continue Anyway*.

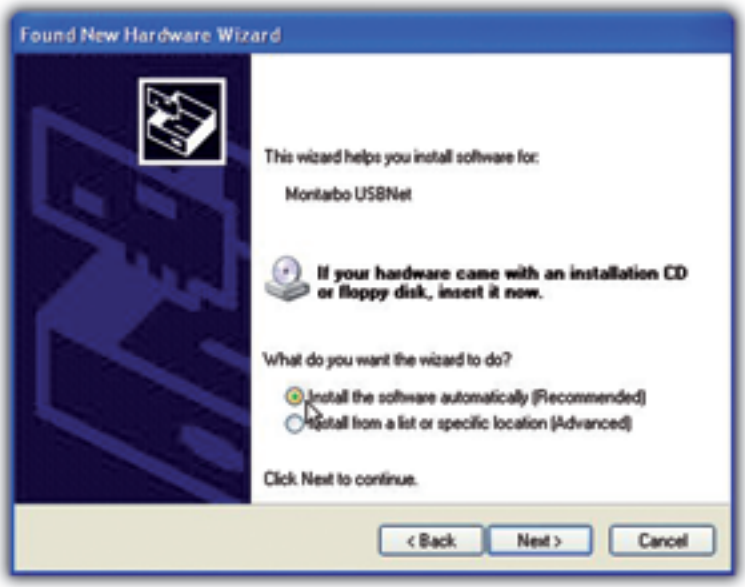
Setup - Montarbo RAConLS
Completing the Montarbo RAConLS Setup Wizard
Setup has finished installing Montarbo RAConLS on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Finish

The following window will display when the RAConLS program setup process has been completed.

Now it is possible to plug in the USB cable and the LD24 interface. The PC will detect the new hardware and will add it to the system's registry.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

The software is located on the PC hard drive so it is not necessary to search for it: select '*No, not this time*' and click *Next*.

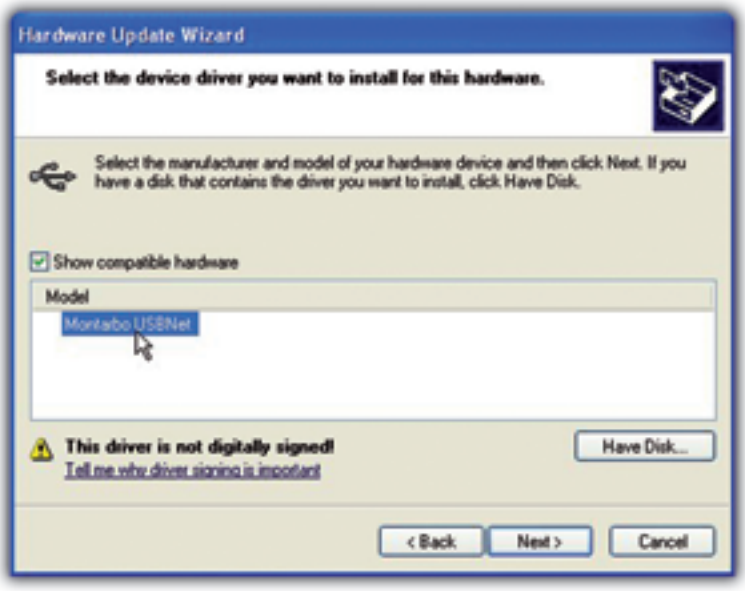

Found New Hardware Wizard
This wizard helps you install software for:
Montarbo USBNet
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

In the following window the operating system will ask how it is to search for the interface driver:

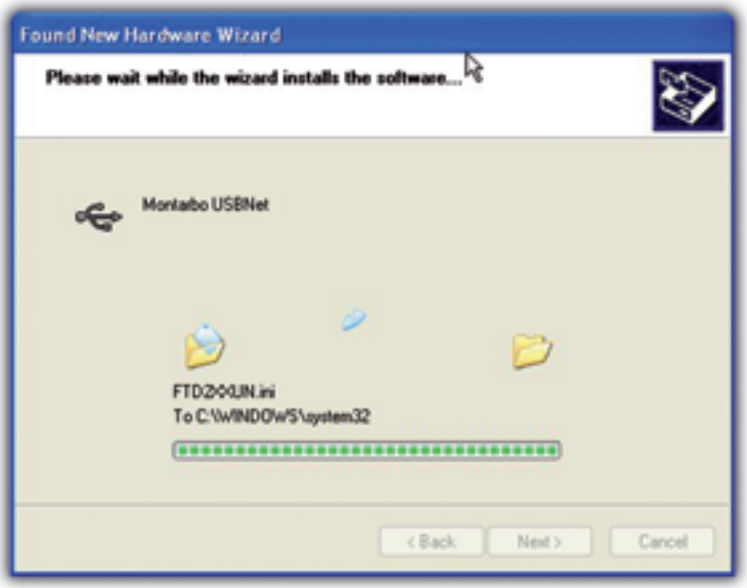
Use the suggested method (recommended) and click *Next*.

Hardware Installation
The software you are installing for this hardware:
Montarbo USBNet
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

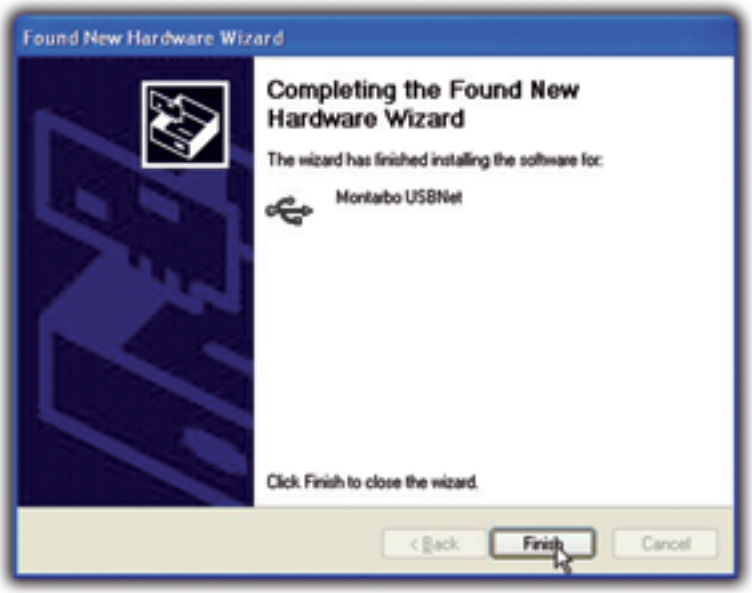
As you did previously, ignore the Windows Logo compatibility message by clicking on *Continue Anyway*.


Hardware Update Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
Montarbo USBNet
This driver is not digitally signed!
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

If requested, select **Montarbo USBNet** and click on *Next*.



The installation process continues with the egistration of the new hardware and its driver.

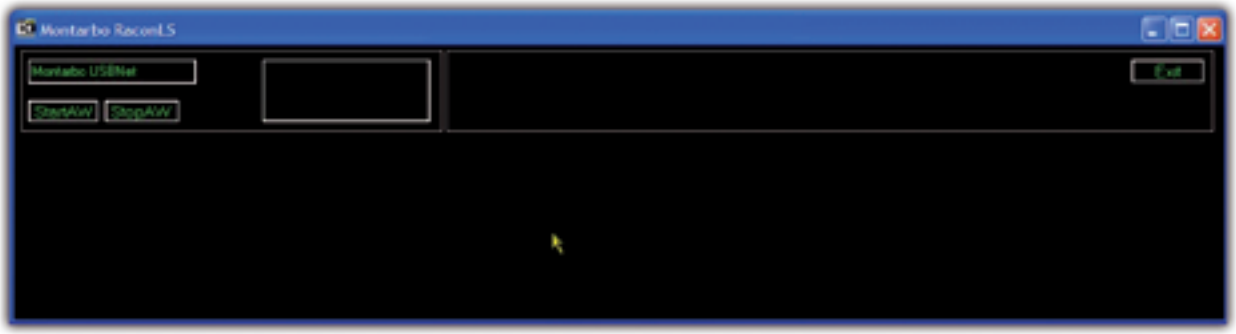


At the end of the process, the LD2.4 interface and the Montarbo USBNet are ready for use.

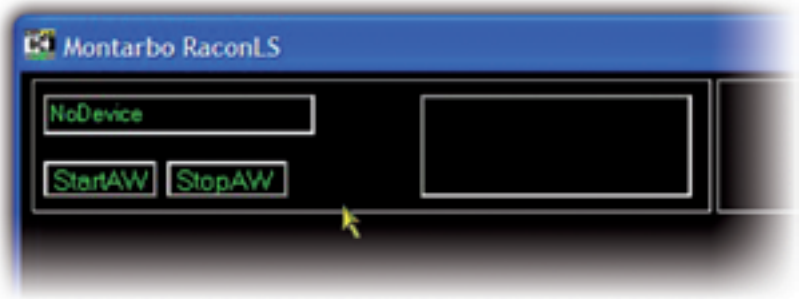
5.3 - USING THE PROGRAM

To start using the program, double click on the desktop icon.

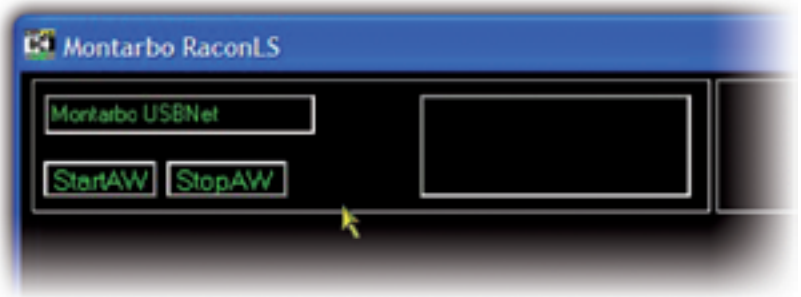
The main program window will be displayed as in the following screen shot (in this case the speaker's registering procedure has not jet been executed, and the speaker's list is empty), or like the one at following page (in which the program has been configured with a network of speakers).



At start-up the program will search for the LD24 USB interface. If there is no interface connected to the PC, the message window will show ***NoDevice***.



In this case, plug in the USB interface with an USB cable to the PC and wait for the Search… message to disappear.
The message window will show ***Montarbo USBNet*** for a short time, then ***Status OK***.



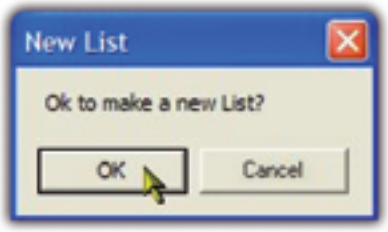
If the program has been previously used with a certain configuration of speakers, the upper-left window will display the list of the registered speakers, and the lower part of the screen will display a group of windows corresponding to the above speakers.

The first time the program is used and each time the configuration of the speakers is altered it will be necessary to register them in the program's database, so that the **RAConLS** program may acknowledge them and duly check them.

5.3.1 - Building the speaker's list

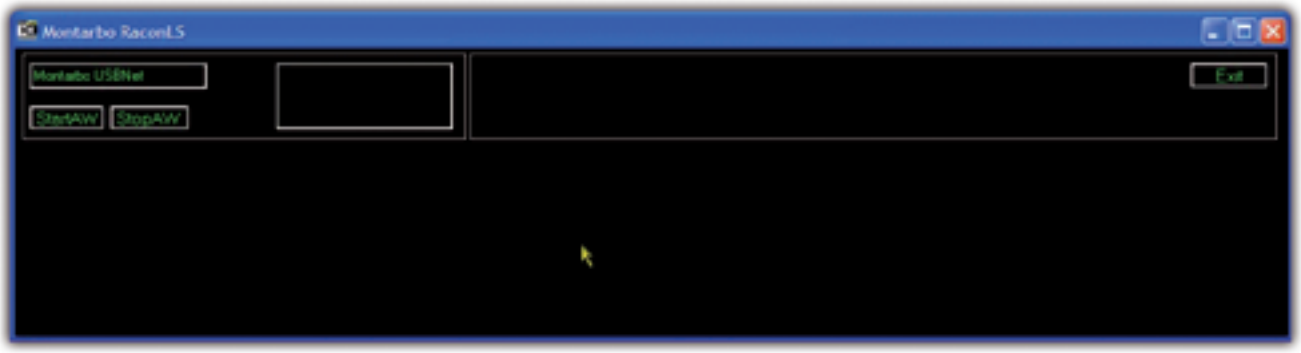
Each speaker system in the Montarbo's FULL, SPOT and WIDE series has, permanently written in the internal DSP's software, a unique ID (name) in the hexadecimal format 'Hxxxxxxxxxxxxxxx', that will distinguish it from all the others (a digital 'serial number').

To start building the speaker's list, click on the ***StartAW*** button (top left).



A small window will open to ask for a confirmation.
Click ***OK*** if you really want to build a new list, otherwise click ***Cancel***.

After clicking ***OK***, the program's windows will be empty.



To register a speaker in the list, push both the rear panel **UP** and **DOWN** buttons **at the same time** (see fig. 'Connections and controls' page 6)
Repeat this operation for all the networked speakers, one at a time.
The speakers will send their ID to the program, which will register them in the list and will display their ID in the upper left window.

When done with the last networked speaker, click on ***StopAW*** to end the process.
The program has now built a speaker's list and the display will look like the following screen.

NOTE: the maximum number of speakers that may be controlled by the RAConLS program is 10.

5.3.2 - Main controller window

IMPORTANT: The networked speakers are displayed as Left / Right pair.
The two speakers in a L/R pair may be linked together and both controlled at the same time, as will be described in the following paragraphs.

The order in which the speakers are displayed is the same as the order in which they were registered by pushing the UP and DOWN buttons.

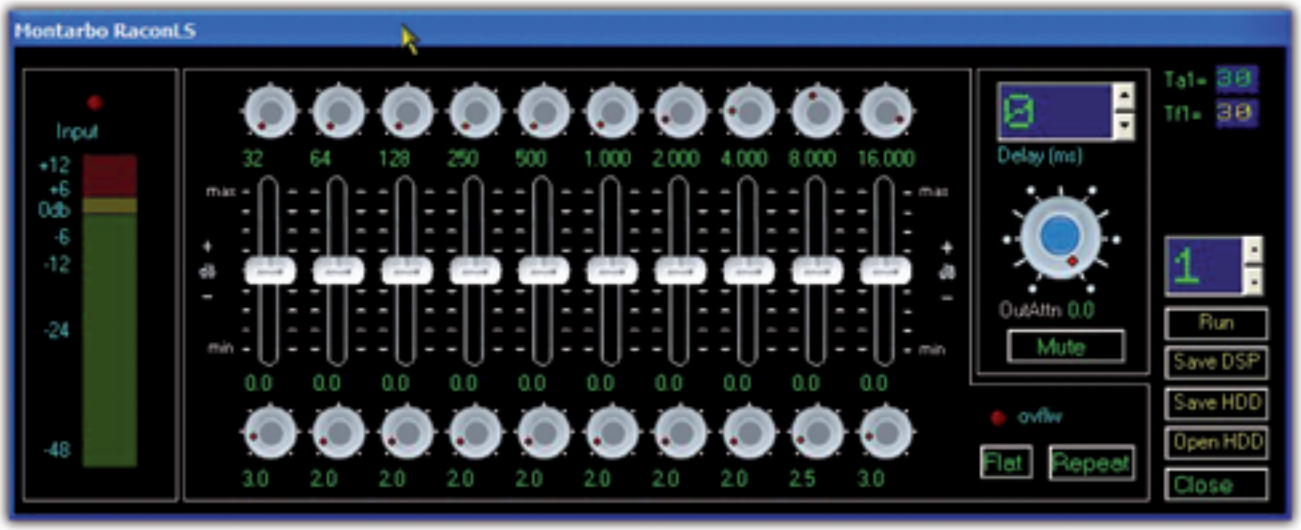
If you wish to group two speakers in a L/R pair (for example the two speaker that form the main stereo FOH system), the corresponding speakers must be registered in sequence (e.g. first/second, third/fourth, fifth/sixth, or seventh/eight, but not second/third etc.).

The windows will display the logos that identify the speakers' series, their unique ID in the hexadecimal format 'Hxxxxxxxxxxxxxxx' and their active Preset.

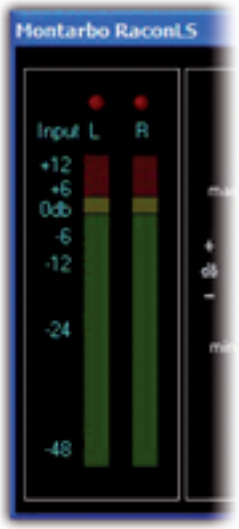
The ***Mute*** button (up-center) is the global mute command that acts on all networked speakers.

Inside the speaker's windows is a single ***Mute*** button that acts on the individual speaker.
By selecting the **L&R Link** tab (placed between the left and right speaker's windows) it is possible to simultaneously control two speakers (this is not possible for the stereo models such as the FULL612).
In this case both the ***Mute*** and ***EDIT*** pushbuttons of the Left speakers are disabled, because they are controlled by the those of the Right speaker.

Clicking on ***Edit*** will open the selected speaker's control windows.



This is the command window from which it is possible to work on all modifiable parameters.



At the left a bar-graph indicates the input levels.
The red indicator light will go on when an A/D converter overload is detected.

When two speakers are linked to form an L/R pair (as described in the previous page), the input level will be indicated by a stereo bar-graph (one bar for each speaker).

The equalizer section includes 10 fully-parametric filters that make it possible to adjust the system's frequency response, to adapt it to a particular room's acoustics or to obtain a personalized response.

The default frequencies are set on standard octave-band centers so that the equalizer may be used as a standard octave graphic equalizer, but each filter is independent and for each one of them it is possible to adjust:
- center frequency, from 10 Hz to 18 kHz
- gain from -9.0 to + 9.0 dB
- Q (filter bandwidth) from 0.2 to 20.0

To adjust a parameter's value, place the cursor of the mouse onto the desired knob and move it while keeping the left button pressed down.

On rotary knobs it is possible to move the cursor to the minimum or maximum position (the cursor will change to a + or – sign), then adjust the parameter by clicking with the left button of the mouse (fine adjustment) or right button (coarse adjustment).

Two buttons on the lower portion of the window will allow you to enable/disable the equalizer (***Flat***) and to 'copy' the equalizer's setting to all the networked speakers (***Repeat***).

The **ovflw** indicator light comes on when the parameter's limits have been exceeded (e.g. maximum gain, low Q and frequency near the limits).
When the ovflw indicator is on, the equalizer's effective settings may be different from the ones shown by the knob settings.

On the upper-right side of the windows are displayed both the ambient (external) temperature (Ta1) and the power amplifier's temperature (Tf1).

When two speakers are linked to form an L/R pair the window will display four temperatures values: Ta1 and Tf1 for the first speaker, Ta2 and Tf2 for the second.

On the right side there is displayed the volume control (output attenuation) window.
It is possible to adjust the volume with the ***OutAttn*** knob.
The attenuation range is from 0.0 to -32.0 dB, with 0.5 dB increments.
The current value is displayed under the control knob.
The ***Delay*** window displays the value of the global delay, set with the two arrow buttons.
The value can be adjusted by one millisecond increments (about 34 cm: 13 inches); the maximum value is 310ms (more than 100 meters: 334 feet).

The ***Mute*** button will mute the speaker.

If a speaker is part of an L/R pair, any control in the command windows will operate on the two linked speakers at the same time: the ***Mute*** button, the ***OutAttn*** knob, the Equalizer's controls and the ***Delay*** setting will operate on both of them.
This way, it is possible to control the two paired speakers from a single command window.

5.3.3 - Management of Presets

The preset management window is shown in the lower right corner.
The upper number indicates the active preset that may be set using the two arrow buttons.
It is possible to save to the PC every adjustment made to the speaker's settings and then recall them later and load them as the active preset.

Once one of the factory preset options (numbered 1 to 4) or the user's preset (number 0) has been selected, it is loaded to the speaker's DSP by clicking ***Run*** and will become active after a delay of a few seconds.

If the preset has been edited (modified by changing the equalizer's setting or the delay) it can be saved on the PC hard disk by clicking the ***SaveHDD*** button, or can be stored in the speaker's DSP by clicking ***SaveDSP***.

The ***OpenHDD*** button allows you to load a preset that has been saved on the PC's hard disk (or on any other memory device) and make it the active preset.

If a speaker is part of an L/R pair, any operation on the presets done on one speaker will be automatically copied on the other.

Important: it is not possible to permanently modify the DSP's factory presets (numbers 1 to 4).
It is possible to permanently store in the DSP an edited (modified) preset only as a User Preset (number 0).
To do so, follow this procedure: load one of the factory presets (1 to 4) and edit it (or load an edited one from the PC, by clicking on ***OpenHD***), then save it as preset number 0 by clicking on ***SaveDSP***.
This way the modified preset will replace the DSP preset number 0, and it may be recalled, even without the **RAConLS** program, by means of the speaker's rear-panel pushbuttons.
So, if the speaker's selected preset is the number 0 (User Preset), it will be the default preset at switch-on.

Any future updated preset which may be made available from Montarbo will be loaded the same way: first saved on the PC as preset files, then recalled and stored as described above.

6 - PRODUCT'S CARE AND MAINTENANCE

• This product has been designed for use in tropical climates and particularly warm weather conditions.

• Never place burning candles or other sources of open flame on top of the device.

• Never expose the enclosure to heat sources (heaters or other products that produce heat).

• Never expose the enclosure to direct sunlight, excessive vibrations or mechanical shocks.

• Avoid operating and storing the enclosure in damp or dusty places: this may lead to malfunctions and premature degrading of specifications.

• Avoid using the enclosure close to strong sources of electromagnetic interferences (e.g. video monitors, high power electrical cabling). This may lead to degradation of audio quality.

• When setting up the system up outdoors, be sure to protect it against rain.

• Care should be taken so that objects do not fall and liquid is not spilled onto the enclosure. In public event don't let people, musicians, technicians or anyone put glasses, cups, ashtrays or cigarettes on the enclosure.

• Always leave the protective grid mounted on the enclosure.

• Use a soft brush or a jet of air to clean the enclosure. Do not use alcohol, solvents or detergents.

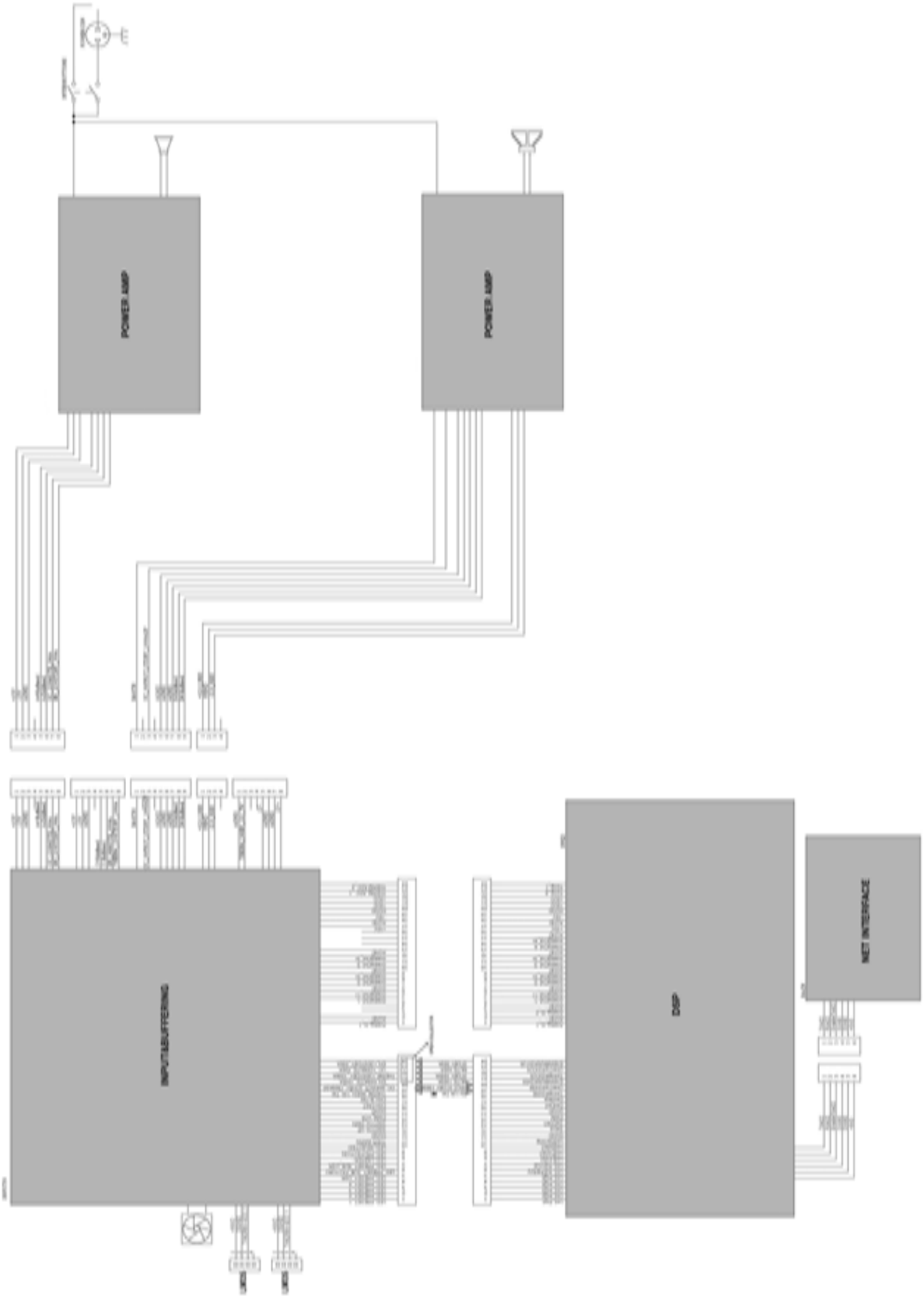
• Take care of your connector cables. Make sure that they are not damaged, knotted or twisted.

• Do not force connectors and controls.

• Make sure the mains power switch is off ('0') before starting any connection.

• As long as it is plugged in there can be dangerous electrical potentials inside the device, so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.

7 - SPOT1500 BLOCK DIAGRAM



8 - TECHNICAL DATA

Enclosure	2-way bass-reflex
Components	custom designed on Montarbo specifications
LF	1 x 15" woofer (4" voice coil) with shielded neodyumium magnet assembly, front-mounted for optimal cooling
HF	1 x compression driver (1.4" throat, 3" voice coil) with neodymium magnet titanium diaphragm fitted to a high directivity (50° H x 40° V) wave guide horn
Frequency response	45 - 20.000 Hz
max. SPL (peak)	135 dB
Electronic cross-over	750 Hz
Built-in amplifier	2 class D power units
LF output power	1000 W
HF output power	500 W
Total Output Power	1500 W EIAJ
Built-in DSP	Montarbo
Processing	56 bit/180 MHz
Conversion	24 bit
Management functions	Filtering, EQ, delay, limiting diagnostic (energy control, external and amp. temperature control) 5 presets, 1 of which is custom-programmable Remote control by PC (of up to 10 systems)
Connections	· balanced XLR connectors for the input, link and DSP processed output for driving external subwoofer · RJ45 DATA connectors for the two RS485FD serial interfaces for the connection to a PC (Montarbo net) · PowerCon® connector for mains power supply (input + link) · volume control · status Led indicators (signal, clipping, thermal warning protection) · active preset LED indicators
Construction	Birch plywood, high-impact, chip-resistant paint, steel protection grill with internal foam protection
Fittings	Carrying handles M10 threaded inserts speaker-stand adapter
Dimensions / Weight	W 440 x H 775 x D 492 mm / 35 kg

Waste from Electrical and Electronic Equipment

Attention !

The crossed out wheeled bin symbol that can be found on this product means that the product is covered by the Waste from Electrical and Electronic Equipment Directive. The symbol is intended to indicate that waste from electrical and electronic equipment must be subject to a selective collection.
For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.

The solid bar underneath indicates that the product has been put on the market after 13th August 2005.

INFORMATION ON PROPER DISPOSAL

Information on Disposal for Users (private households)

In the European Union
Attention: If you want to dispose of this equipment, please do not use the ordinary dust bin! Used electrical and electronic equipment should not be disposed of via the normal household waste stream but must be treated separately and in accordance with legislation that requires proper treatment, recovery and recycling of used electrical and electronic equipment.
Following the implementation by member states, private households within the EU states may return their used electrical and electronic equipment to designated collection facilities free of charge*. In some countries* your local retailer may also take back your old product free of charge if you purchase a similar new one. * Please contact your local authority for further details.
In other Countries outside the EU: If you wish to dispose of this product, please contact your local authorities and ask for the correct method of disposal.
In Switzerland: Used electrical or electronic equipment can be returned free of charge to the dealer, even if you don't purchase a new product. Further collection facilities are listed on the homepage of www.swico.ch or www.sens.ch.

Information on Disposal for Professional Users

In the European Union
If the product is used for business purposes and you want to discard it: please contact your Montarbo dealer who will inform you about the take-back of the product. You might be charged for the costs arising from take-back and recycling. Small products (and small amounts) might be taken back by your local collection facilities.
In Spain: Please contact the established collection system or your local authority for takeback of your used products.
In other Countries outside the EU: please contact your local authorities and ask for the correct method of disposal.

IMPORTANT!

In order to send you upgrades of the software as they become available you must e-mail* us at **master@montarbo.com** or send a fax to this number +39 051 765 226, including:

- the system serial number
- your e-mail address,
- your complete address
- your telephone number

* When we get your e-mail with the requested data, you will be sent notification of receipt.

SPOT SERIES

The information contained in this manual have been carefully drawn up and checked. However no responsibility will be assumed for any incorrectness.
This manual cannot cover all the possible contingencies which may arise during the product installation and use.
Should further information be desired, please contact us or our local distributor.

Elettronica Montarbo srl can not be considered responsible for damages which may be caused to people and things when using this product

Specifications, features and pictorial material are subject to change without prior notice.

SPOT 1500

PROFESSIONAL LOUDSPEAKER SYSTEM

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